

Appl. No. 09/889,484
Amendment dated February 19, 2004
Reply to Office Action of August 19, 2004

AMENDMENTS TO THE SPECIFICATION:

Please replace the paragraph beginning at page 3, line 13 with the following rewritten version:

-- In a first embodiment of the present invention, [[A]] a method for drying substrates of claim 1 houses substrates within a processing container, and dries a surface of each substrate by relatively lowering a fluid face of cleaning fluid within a processing container with respect to the substrate and by introducing the drying fluid within the processing container, the method comprises steps of,

Introducing drying fluid under a liquid condition within the processing container, and
Injecting the introduced drying fluid onto the fluid face of the cleaning fluid using a nozzle. --

Please replace the paragraph beginning at page 4, line 1 with the following rewritten version:

-- In a second aspect of the present invention, [[A]] a method for drying substrates of claim 2 blows inert gas for atomizing the drying fluid. --

Please replace the paragraph beginning at page 4, line 3 with the following rewritten version:

-- In a third aspect of the present invention, [[A]] a method for drying substrates of claim 3 intermittently introduces the drying fluid within the processing container. --

Please replace the paragraph beginning at page 4, line 6 with the following rewritten version:

-- In a fourth aspect of the present invention, [[A]] a device for drying substrates of claim 4 houses substrates within a processing container, and dries a surface of each substrate by relatively lowering a fluid face of cleaning fluid within a processing container with respect to the substrate and by introducing the drying fluid within the processing container, the device comprises,

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Drying fluid supplying means for introducing drying fluid under a liquid condition within the processing container, and for injecting the introduced drying fluid onto the fluid face of the cleaning fluid using a nozzle. --

Please replace the paragraph beginning at page 4, line 19 with the following rewritten version:

-- In a fifth aspect of the present invention, [[A]] a device for drying substrates of claim 5 further comprises blowing means for blowing inert gas for atomizing the drying fluid, the blowing means being near the drying fluid supplying means. --

Please replace the paragraph spanning pages 4 and 5 (beginning at page 4, line 24) with the following rewritten version:

-- In a sixth aspect of the present invention, [[A]] a device for drying substrates of claim 6 further comprises control means for controlling the drying fluid supplying means so as to intermittently introduce the drying fluid within the processing container. --

Please replace the paragraph beginning at page 5, line 3 with the following rewritten version:

-- In a seventh aspect of the present invention, [[A]] a method for drying substrates of claim 7 houses substrates within a processing container, and dries a surface of each substrate by relatively lowering a fluid face of cleaning fluid within a processing container with respect to the substrate and by introducing the drying fluid within the processing container, the method comprises steps of,

Conveying liquid drying fluid to exhaust opening of a nozzle using carrier gas, and
Simultaneously blowing the drying fluid and the carrier gas from the exhaust opening towards an upper face of the cleaning fluid. --

Please replace the paragraph spanning pages 5 and 6 (beginning at page 5, line 16) with the following rewritten version:

-- In an eighth aspect of the present invention, [[A]] a device for drying substrates of claim 8 houses substrates within a processing container, and dries a surface of each substrate

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by relatively lowering a fluid face of cleaning fluid within a processing container with respect to the substrate and by introducing the drying fluid within the processing container, the device comprises,

Drying fluid supplying means for conveying liquid drying fluid to exhaust opening of a nozzle using carrier gas, and for simultaneously blowing the drying fluid and the carrier gas from the exhaust opening towards an upper face of the cleaning fluid. --

Please replace the paragraph beginning at page 6, line 3 with the following rewritten version:

-- In a ninth aspect of the present invention, ~~[[A]]~~ a device for drying substrates of ~~claim 9~~ wherein the drying fluid supplying means comprises a first feed pipe for supplying carrier gas to the nozzle and a second feed pipe for supplying liquid drying fluid which is communicated to the halfway of the first feed pipe. --

Please replace the paragraph beginning at page 6, line 10 with the following rewritten version:

-- In a tenth aspect of the present invention, ~~[[A]]~~ a device for drying substrates of ~~claim 10~~ wherein the drying fluid supplying means comprises a first feed pipe for supplying carrier gas to the nozzle and a second feed pipe for supplying liquid drying fluid to the nozzle, the first feed pipe and the second feed pipe being independently provided from one another. --

Please replace the paragraph spanning pages 6 and 7 (beginning at page 6, line 17) with the following rewritten version:

-- When the method for drying substrates of ~~claim 1~~ the first aspect is employed, the method houses substrates within the processing container, and dries the surface of each substrate by relatively lowering the fluid face of cleaning fluid within the processing container with respect to the substrate and by introducing the drying fluid within the processing container. During this operation, the method introduces drying fluid under a liquid condition within the processing container, and ~~injects~~ injects the introduced drying fluid onto the fluid face of the cleaning fluid using a nozzle. Therefore, the drying fluid is

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smoothly introduced between the substrates due to the influence of dead weight of the liquid drying fluid so that the drying fluid is supplied with higher density with respect to the density of the vapor supplying so as to improve MARANGONI effect. Consequently, a liquid layer of the drying fluid is generated on the cleaning fluid so that drying of the substrates with greatly little drying mark is rapidly realized using MARANGONI effect. Further, the drying fluid is supplied in a liquid phase condition, so that the entirety or almost all of the drying fluid is discharged with the cleaning fluid. Consequently, leakage of the drying fluid is decreased up to nearly zero so that exhaust equipment is eliminated or is simplified. As a result, a decrease in cost is realized. --

Please replace the paragraph spanning pages 7 and 8 (beginning at page 7, line 21) with the following rewritten version:

-- When the method for drying substrates of ~~claim 2~~ the second aspect is employed, the method blows inert gas for atomizing the drying fluid. Therefore, disadvantage is prevented from occurrence that droplet of the injected liquid drying fluid becomes too large, so that superior drying of the substrates is realized. In addition, operations and effects are realized which are similar to those of ~~claim 1~~ the first aspect. --

Please replace the paragraph beginning at page 8, line 3 with the following rewritten version:

-- When the method for drying substrates of ~~claim 3~~ the third aspect is employed, the method intermittently introduces the drying fluid within the processing container. Therefore, increase in consumption quantity of the drying fluid following the supplying of the drying fluid in a liquid condition is suppressed. In addition, operations and effects are realized which are similar to those of ~~claim 1 or claim 2~~ the first aspect or the second aspect. --

Please replace the paragraph beginning at page 8, line 12 with the following rewritten version:

-- When the device for drying substrates of ~~claim 4~~ the fourth aspect is employed, the device houses substrates within the processing container, and the device dries the surface of each substrate by relatively lowering the fluid face of cleaning fluid within the processing

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container with respect to the substrate and by introducing the drying fluid within the processing container. --

Please replace the paragraph beginning at page 9, line 16 with the following rewritten version:

-- When the device for drying substrates of ~~claim 5~~ the fifth aspect is employed, the device further comprises blowing means for blowing inert gas for atomizing the drying fluid, the blowing means being near the drying fluid supplying means. Therefore, disadvantage is prevented from occurrence that droplet of the injected liquid drying fluid becomes too large, so that superior drying of the substrates is realized. In addition, operations and effects are realized which are similar to those of ~~claim 4~~ the fourth aspect. --

Please replace the paragraph beginning at page 10, line 1 with the following rewritten version:

-- When the device for drying substrates of ~~claim 6~~ the sixth aspect is employed, the device further comprises control means for controlling the drying fluid supplying means so as to intermittently introduce the drying fluid within the processing container. Therefore, increase in consumption quantity of the drying fluid following the supplying of the drying fluid in a liquid condition is suppressed. In addition, operations and effects are realized which are similar to those of ~~claim 4 or claim 5~~ the fourth aspect or the fifth aspect. --

Please replace the paragraph beginning at page 10, line 12 with the following rewritten version:

-- When the method for drying substrates of ~~claim 7~~ the seventh aspect is employed, the method houses substrates within the processing container, and dries the surface of each substrate by relatively lowering the fluid face of cleaning fluid within the processing container with respect to the substrate and by introducing the drying fluid within the processing container. During this operation, the method conveys liquid drying fluid to exhaust opening of the nozzle using carrier gas, and the method simultaneously blows the drying fluid and the carrier gas from the exhaust opening towards the upper face of the cleaning fluid. --

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Please replace the paragraph spanning pages 11 and 12 (beginning at page 11, line 24) with the following rewritten version:

-- When the device for drying substrates of ~~claim 8~~ the eighth aspect is employed, the device houses substrates within the processing container, and the device dries the surface of each substrate by relatively lowering the fluid face of cleaning fluid within the processing container with respect to the substrate and by introducing the drying fluid within the processing container. During this operation, the drying fluid supplying means conveys liquid drying fluid to exhaust opening of the nozzle using carrier gas, and simultaneously blows the drying fluid and the carrier gas from the exhaust opening towards the upper face of the cleaning fluid. --

Please replace the paragraph beginning at page 13, line 9 with the following rewritten version:

-- When the device for drying substrates of ~~claim 9~~ the ninth aspect is employed, the drying fluid supplying means comprises a first feed pipe for supplying carrier gas to the nozzle and a second feed pipe for supplying liquid drying fluid which is communicated to the halfway of the first feed pipe. Therefore, the blowing quantity of the drying fluid from each blowing opening is determined to be a proper quantity so that the consumption quantity of the drying fluid is decreased and the cost is decreased. In addition, operations and effects are realized which are similar to those of ~~claim 8~~ the eighth aspect. --

Please replace the paragraph spanning pages 13 and 14 (beginning at page 13, line 22) with the following rewritten version:

-- When the device for drying substrates of ~~claim 10~~ the tenth aspect is employed, the drying fluid supplying means comprises a first feed pipe for supplying carrier gas to the nozzle and a second feed pipe for supplying liquid drying fluid to the nozzle, the first feed pipe and the second feed pipe being independently provided from one another. Therefore, the liquid drying fluid is guided by the carrier gas to the blowing opening within the nozzle. In addition, operations and effects are realized which are similar to those of ~~claim 8~~ the eighth aspect. --

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Please replace the paragraph spanning pages 16 and 17 (beginning at page 16, line 19) with the following rewritten version:

-- After the substrates 1 ~~has~~ have been cleaned by housing the cleaning fluid 2 within the processing container 3 in which the substrates 1 are housed ~~therein~~, the fluid face of the cleaning fluid 2 is lowered by discharging the cleaning fluid 2 from the processing container 3 and the drying fluid is supplied through the feed pipe 4 and is injected by the injection nozzle 5. As a result, a fluid layer of the injected drying fluid is formed on the surface of the cleaning fluid 2 so that portions exposed from the surface of the cleaning fluid 2 among the plurality of substrates 1 are rapidly dried without drying marks due to the MARANGONI effect. --

Please replace the paragraph beginning at page 17, line 17 with the following rewritten version:

-- When the above series of drying operations is carried out, almost all drying fluid supplied in a liquid condition is discharged with the cleaning fluid 2 from the processing container 3 to an outer section so that the drying fluid scarcely leaks into neighboring sections with respect to the processing container 3. As a result, ~~an~~ exhausting equipment for exhausting the drying fluid is eliminated or simplified so as to realize a decrease in cost. --